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Herbalists of Today's Switzerland and Their Plant Knowledge. A Preliminary Analysis from an Ethnobotanical Perspective

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Keywords
Ethnobotany · Herbalists · Medicinal plants · Herbalism · Switzerland

Summary
Background: Herbal medicine is a popular part of primary health care in Switzerland. Following an ethnobotanical approach, in this study we seek to identify Swiss herbalists with broad, empirical medicinal plant knowledge and use. We aim to consider different areas of the medicinal landscape including biomedicine, complementary and alternative medicine, and self-medication. **Material and Methods:** A total of 61 expert interviews were conducted from February 2010 to November 2011. The transfer of knowledge was analyzed according to a Switzerland-related selection of historical and recent popular as well as scientific herbal books. **Results:** A total of 254 medicinal plant species, belonging to 218 genera and 87 families, were recorded in 934 use reports. Predominantly leaves and flowers are used for the treatment of dermatological, respiratory, nervous, and gastrointestinal problems. Recent to historical herbal books are an important source of plant knowledge. **Conclusions:** Medicinal plants are used for self-medication and professional health care and despite different underlying medicinal concepts and philosophies, herbalists largely agree on the most important medicinal plant species.

Schlüsselwörter
Ethnobotanik · Kräuterkundige · Arzneipflanzen · Kräuterkunde · Schweiz

Zusammenfassung
Hintergrund: Sowohl in den schul- und komplementärmedizinischen als auch in volksheilkundlichen Bereichen der medizinischen Landschaft der Schweiz werden Arzneipflanzen angewendet. Die vorliegende Arbeit untersucht unter ethnobotanischer Perspektive den aktuellen Heilpflanzengebrauch in der Deutschschweiz, dokumentiert verwendete Arten mit ihren Indikationen und eruiert den Wissenstransfer über Kräuterbücher. **Material und Methoden:** Zwischen Februar 2010 und November 2011 wurden 61 Experteninterviews mit Kräuterkundigen durchgeführt. Der Wissenstransfer wurde anhand einer für die Schweiz relevanten Auswahl von Kräuterbüchern analysiert. **Ergebnisse:** Insgesamt wurden 254 Medizinalpflanzen (218 Gattungen aus 87 Familien) in 934 Anwendungsnennungen (use reports) dokumentiert. Hauptsächlich werden Blätter und Blüten für die Behandlung von Hautproblemen, Atemwegserkrankungen, Beeinträchtigungen des Nervensystems sowie gastrointestinalen Beschwerden verwendet. Als Wissensquellen werden zeitgenössische und historische Kräuterbücher angegeben. **Schlussfolgerungen:** Die Auswahl an heute genutzten Arzneipflanzen in der Schweiz umfasst vor allem gut bekannte Arten mit einem breiten Einsatzgebiet. Trotz unterschiedlicher medizinischer Konzepte und Philosophien der Kräuterkundigen gibt es eine große Übereinstimmung bei der Verwendung vieler Arzneipflanzen.

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Introduction

In traditional communities and societies, usually a variety of specialists are responsible for human well-being and primary health care. These may include healers, bone setters, midwifes, herbalists, ritual specialists, religious specialists, and mediums among others [1–3]. Nowadays, even in very remote areas biomedical products and/or biomedical facilities dominate the medical landscape [4, 5]. This is particularly the case in so-called industrialized countries, despite the above-mentioned diversity of what is subsumed as complementary or alternative medicine (CAM) [6, 7].

Plants play an important role in any medical landscape. Phytotherapy can be part of biomedical practice, so-called alternative medicine or self-medication. In ethnobotanical studies concerning traditional or rural societies, the term 'herbalist' usually refers to a type of medicinal specialist having profound knowledge in medicinal plants and treating patients with plant-based remedies [4, 8]. Plant medicine is either prepared by the herbalist or by the patient's family according to the received recipe.

While it is obvious that herbal medicine is a popular part of primary health care in Switzerland [9, 10], the term 'herbalist' cannot be applied in the same way as it is often used in the context of ethnobotanical studies of traditional societies. For example, in Switzerland, the production of plant remedies is professionally separated from therapy. While pharmacists are responsible for the former, medical doctors and other practitioners take care of the later. It is only in the field of self-medication (homemade remedies) where collection, preparation, and administration of plants can legally be performed by one and the same person. Thus, if we are interested in medicinal plant knowledge and use in Switzerland, we do not only have to consider the practitioners, but also include the producers of herbal medicine. In this context and in reference to ethnobotanical studies, we define 'herbalists' as persons who have empirical medical plant knowledge and medicinal plant specialists, respectively, who cultivate, collect, process and/or administer medicinal plants. This goes in line with the German translations of English 'herbalist' [11], French 'herboriste' [12], and Italian [13] 'erborista', which always include both the «Kräuterarzt» (practitioner) and the «Kräutersammler» (collector/seller). For our study we translate herbalist as «Kräuterkundige/r» (expert).

The diversity of medicinal plants documented in herbals and medicinal plant books relevant for Switzerland was at its peak during Renaissance, and slightly decreased afterwards, with a total of ca. 768 species of the Swiss flora documented over the last centuries [14]. Ethnobotanical studies conducted in specific geographical regions of Switzerland hardly document any plant use not previously mentioned in these plant books.

Following an ethnobotanical approach, we aimed at identifying herbalists of the German-speaking part of Switzerland with broad, empirical medicinal plant knowledge and the plants they know and use, thereby considering different areas of the medicinal landscape including biomedicine, CAM, and self-medication. We try to elucidate the diversity of plant use among different practitioners and to what degree the different backgrounds and schools are mirrored in the knowledge and use of medicinal plants.

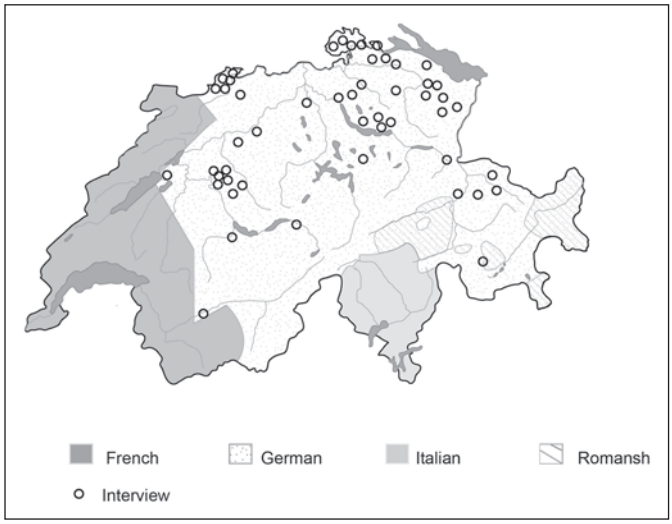

Fig. 1. Switzerland with the German-, French-, Italian-, and Romansh-speaking parts shaded in in different colors. The black circles indicate where the interviews took place.

Material and Methods

Switzerland harbors 4 linguistically and culturally distinguishable areas: the French-, German-, Italian-, and Romansh-speaking part. We here confine our research to the German-speaking part of Switzerland, considering both urban as well as rural regions (fig. 1).

Herbalists (Kräuterkundige) were found by stratified snowball sampling [15]. Key interviewees representing different fields of the medical landscape, such as biomedicine, CAM, and self-medication were asked to name other persons whom they perceive as knowledgeable in herbs (kräuterkundig). Semistructured expert interviews were conducted by M.D.C. from February 2010 to November 2011 (appendix I, *www.karger.com/doi/10.1159/000438809*). A total of 61 expert interviews were conducted and complemented with 3 group interviews ($n_1 = 5$, $n_2 = 6$, $n_3 = 4$). The participants of the group interviews were chosen according to the main fields of medicinal landscape and as reference for cross-checking the information from the expert interviews.

The age of the herbalists ranged from 30 to 70 years, with most persons being between 50 and 60 years old. Overall, 32 herbalists had completed a certified training in phytotherapy, 17 a biomedical training (nurse, medical doctor, or pharmacist). Out of the 61 interviewees 40 (25 female/15 male) use medicinal plants in a professional context as CAM therapists (17), herb merchants (4), farmers (2), gardeners (3), pharmacists (3), teachers (3), nurses (4), artists (1), cosmetics manufacturers (1), medical doctors (1), or remedies manufacturers (1). The remaining 21 interviewees (19 female / 2 male) use their medicinal plant knowledge in a private context only. For the analysis we grouped the herbalists into 3 equally-sized groups: non-professional herbalists (laypeople), CAM therapists, and other professionals (without CAM therapists).

The herbalists were asked for the most often used medicinal plants (freelist), their kind of use, routes of administration, and preparation. In addition, they were asked to name the 5 most important plants. For the analysis each citation of a particular part of a specific plant for a specific use was recorded as one use report (UR). The routes of administration were grouped into systemic (internal) applications, topical applications, and inhalation. Indications were grouped into 12 disease categories related to organs and symptoms (appendix II, *www.karger.com/doi/10.1159/000438809*). The categories are basically following Leonti et al. [16]. Furthermore, a total of 51 herbalists were asked for their main source of medicinal plant knowledge 41 of whom provided useful information for the analysis. We used the species complexes (aggregates, agg.) as defined in 'Flora indicativa' [17] as they often correspond with the ethnotaxa mentioned by herbalists. Nomenclature followed the plant list [18], e.g., family names the APG system [19].

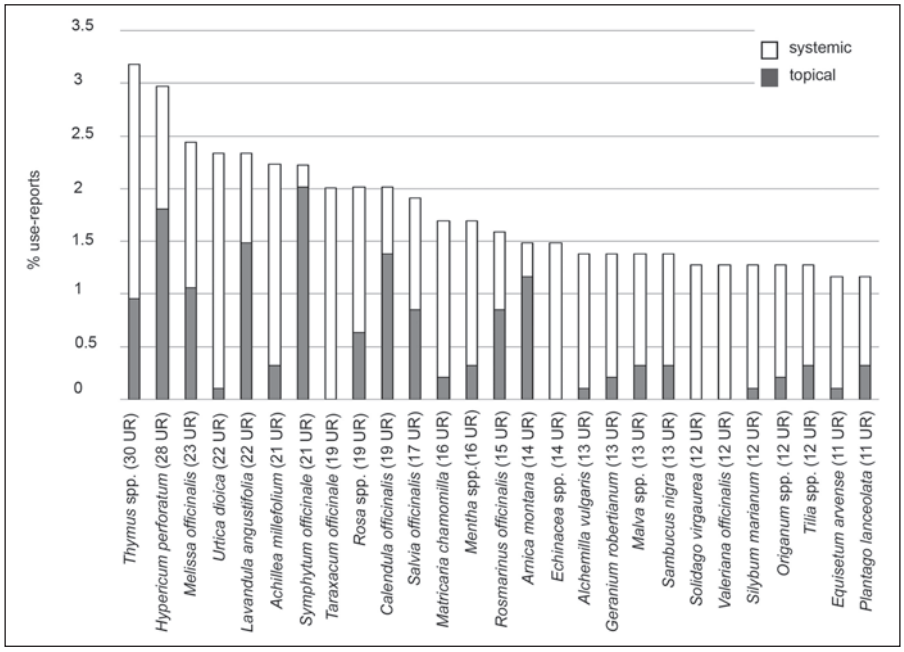

Fig. 2. Species with more than 10 use reports (n_{UR} = 934).

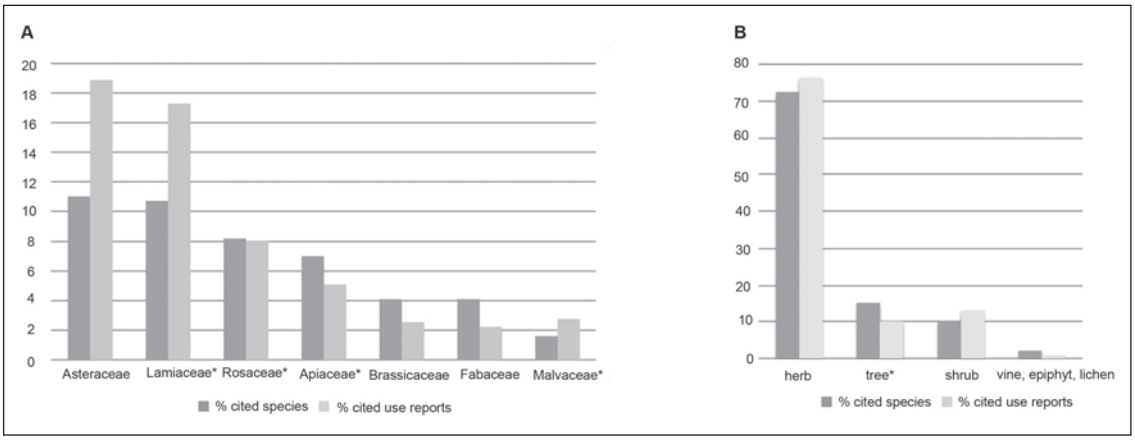

Fig. 3. A) Plant families comprising the majority of the cited species; **B)** habit of the medicinal plant species and use reports (n_{sp} = 254; n_{UR} = 934). Asterisks indicate overrepresented plant families relative to the Swiss flora.

To track knowledge transfer we compared the documented medicinal plants with entries in historical and recent popular and scientific herbal books as listed by Dal Cero et al. [14]. Since different authors provided by the herbalists as important sources were not always linked to specific books/editions, this was a more convenient way for the analysis.

The prevalence of the documented specific plant families, habits, and habitats was analyzed in relation to the Swiss flora using the Bayesian approach following Weckerle et al. [20].

Results

Medicinal Plant Knowledge of Herbalists in Switzerland

A total of 254 medicinal plant species, belonging to 218 genera and 87 plant families were recorded with a total of 934 use reports (appendix III, *www.karger.com/doi/10.1159/000438809*) with scientific and vernacular names, habit and habitat of the species, plant parts used, a description of use, and the UR number.

Most herbalists (n = 59) emphasized that they prefer to use native plants. Of the documented species and aggregates, 221 (87%) are listed in the 'Flora Helvetica' [21] as occurring in Switzerland, making up 9,4% of the Swiss flora (N = 2358, total number of vascular plants, i.e. species and aggregates of Switzerland; estimate based on [17] aligned with [21]). Of these, 110 (50%) are indigenous, 68 (31%) archeophytes, and 43 (19%) neophytes. The remaining 32 (13%) are Mediterranean, tropical, or subtropical species and not included in the Swiss flora. The only non-vascular plant documented is the lichen *Cetraria islandica*. Only 10 species were mentioned by more than 20% (13) of the herbalists, in particular *Hypericum perforatum* (21), *Urtica dioica* (19), *Symphytum officinale* (18), *Taraxacum officinale* (16), *Calendula officinalis* (14), *Matricaria chamomilla* (14), *Salvia officinalis* (14), *Thymus vulgaris* (14), *Melissa officinalis* (16) and *Achillea millefolium* (13). Overall, 129 species were listed by 2–12 of the interviewees; and 107 were mentioned only once. Figure 2 shows the medicinal plants with more than 10 UR indicating topical and systemic administration.

The documented plants mainly belong to the Asteraceae, Lamiaceae, Rosaceae, Apiaceae, Brassicaceae and Fabaceae (fig. 3A). However, relative to the family size, only the Apiaceae, Lamiaceae,

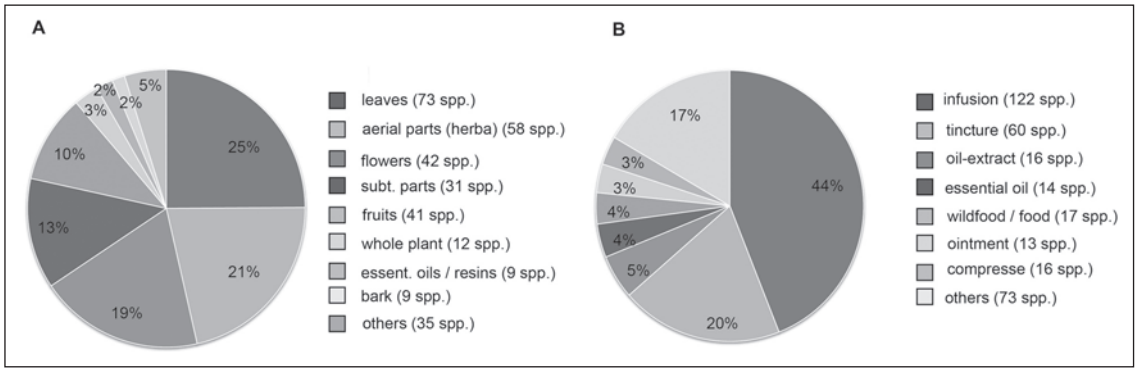

Fig. 4. Shares of **A)** plant parts used (percentage of use reports n = 934); **B)** preparation forms (percentage of use reports n_{UR} = 934).

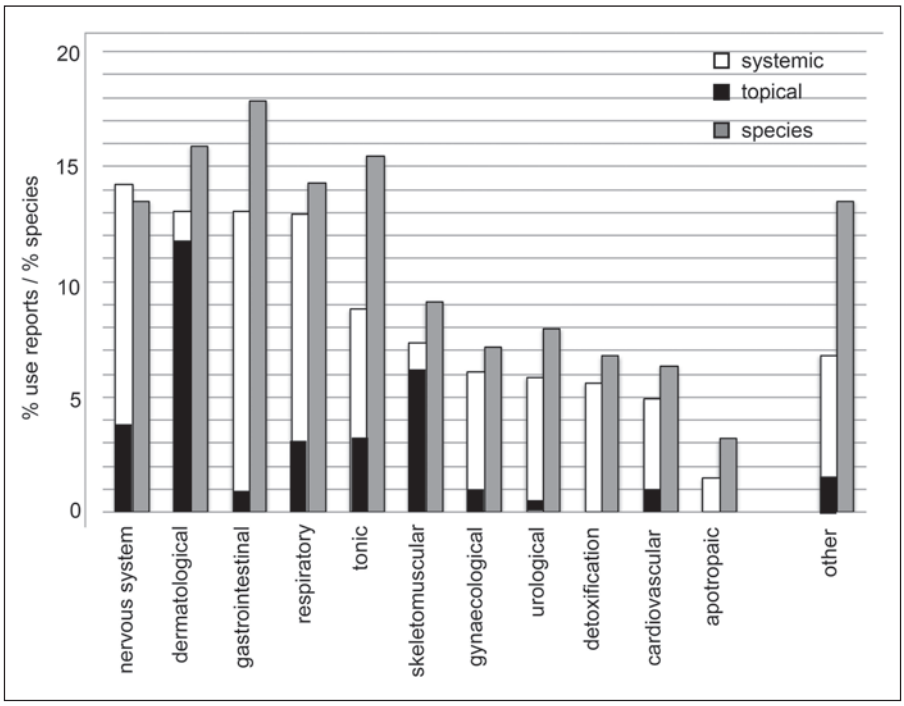

Fig. 5. Major disease categories: percentage of use reports compared to the percentage of species (n_{UR} = 920; n_{sp} = 254).

and Rosaceae are significantly overrepresented in our dataset, whereas the Caryophyllaceae, Cyperaceae, Orchidaceae, and Poaceae are underrepresented.

The documented plants are mainly herbs, but in relation to their natural occurrence trees are overrepresented in our dataset (fig. 3B). The same is true for archeophytes. Regarding habitats, forest plants are overrepresented and mountain and marsh plants are underrepresented.

Medicinal Plant Use

The cited species are collected in their natural habitats or grown in the garden by 47% of the participants, while 34% buy their plants and herbs either in dried form or as manufactured remedy or phytopharmaceutical; 19% of the species are either collected or bought. Figure 4 shows user preferences of plant parts and preparations.

Most of the species are either used systemically (75%; internal, oral application) or topically (23%; application on skin or mucosa), a few species were mentioned to be used as inhalation (2%; smoke, steam, essential oil). They are also used in the context of magical practice (e.g., protection of stables and homes), even though in a very few cases only (<1%). The different disease categories mentioned are shown in figure 5.

Herbal Books and Teachers as Important Sources of Knowledge

In their everyday work, the herbalists source their knowledge from books of 22 different authors (fig. 6) of which 7 were also mentioned as teachers (i.e. important persons known personally by the herbalists).

Beside one species from the Swiss flora (*Silene flos-cuculi*) and one exotic species (*Okoubaka aubrevillei*), all of the currently used medicinal plants are documented in the considered herbal books of previous centuries and decades (fig. 7).

Plant Preferences among the 3 Subgroups of Herbalists

Figure 8 shows the similarities and differences between the non-professionals (laypeople), CAM therapists, and other professionals regarding the 5 most important plants used. Figure 9 shows the overlap between these 3 groups in respect to their knowledge sources.

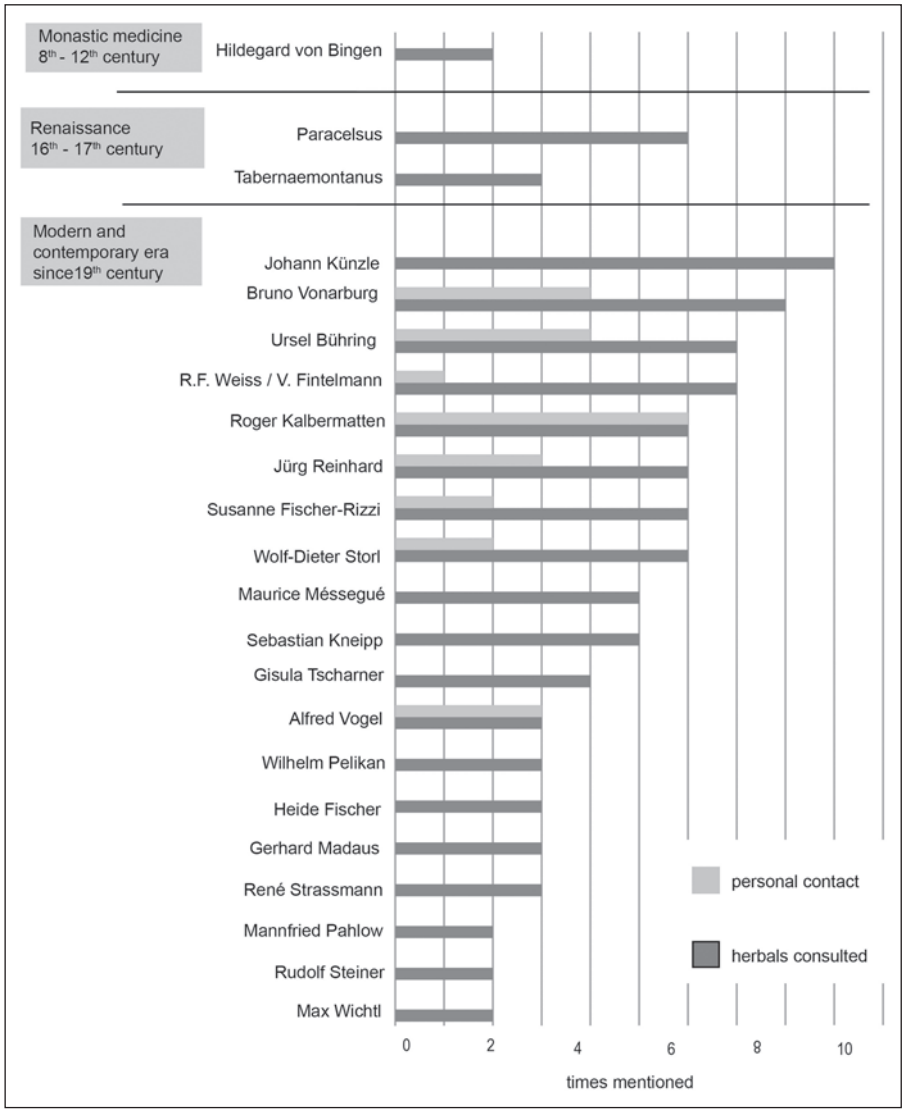

Fig. 6. Authors of medicinal plant books regularly referred to by herbalists (dark grey); authors that the herbalists know as teachers (light grey).

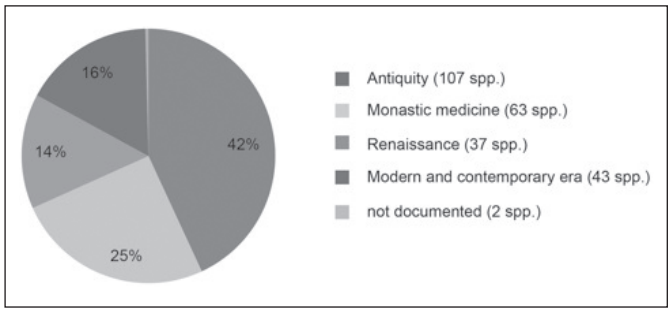

Fig. 7. Percentage of medicinal plants documented for the first time in different time periods (n = 254).

Discussion

Herbal medicine is a popular part of primary health care in Switzerland [9]. Like in other Western countries the Swiss medical landscape is characterized by pluralism; beneath biomedical supremacy there is a vibrant CAM network. Drug use, including medicinal plants, is highly regulated and this legal framework strongly influences plant knowledge and use especially in the professional sector. This is reflected in the fact, that plant knowledge comprises almost exclusively well-known and well-documented medicinal plants.

Herbalists, defined as persons who have empirical medical plant knowledge and are perceived as knowledgeable by others, can be found in different areas of the Swiss medical landscape including biomedicine, CAM, and self-medication. Despite different philosophies and etiological models underlying the use of medicinal plants by herbalists, we found a remarkable consistency in choice of most important species including so-called detoxifying plants like *Taraxacum officinale* (e.g., roots), *Urtica dioica* (e.g., leaves), and *Silybum marianum* (e.g., seeds). These plants are known for their diuretic, cholagogue, and hepatoprotective effects [22]. Detoxification is a common concept within CAM and self-medication for preventing disease (e.g., diabetes or cancer). Biomedicine rather focuses on the hepatoprotective effects of these plants in cancer treatment [23–26]. Among the surveyed practitioners, the topical and systemic use of *H.*

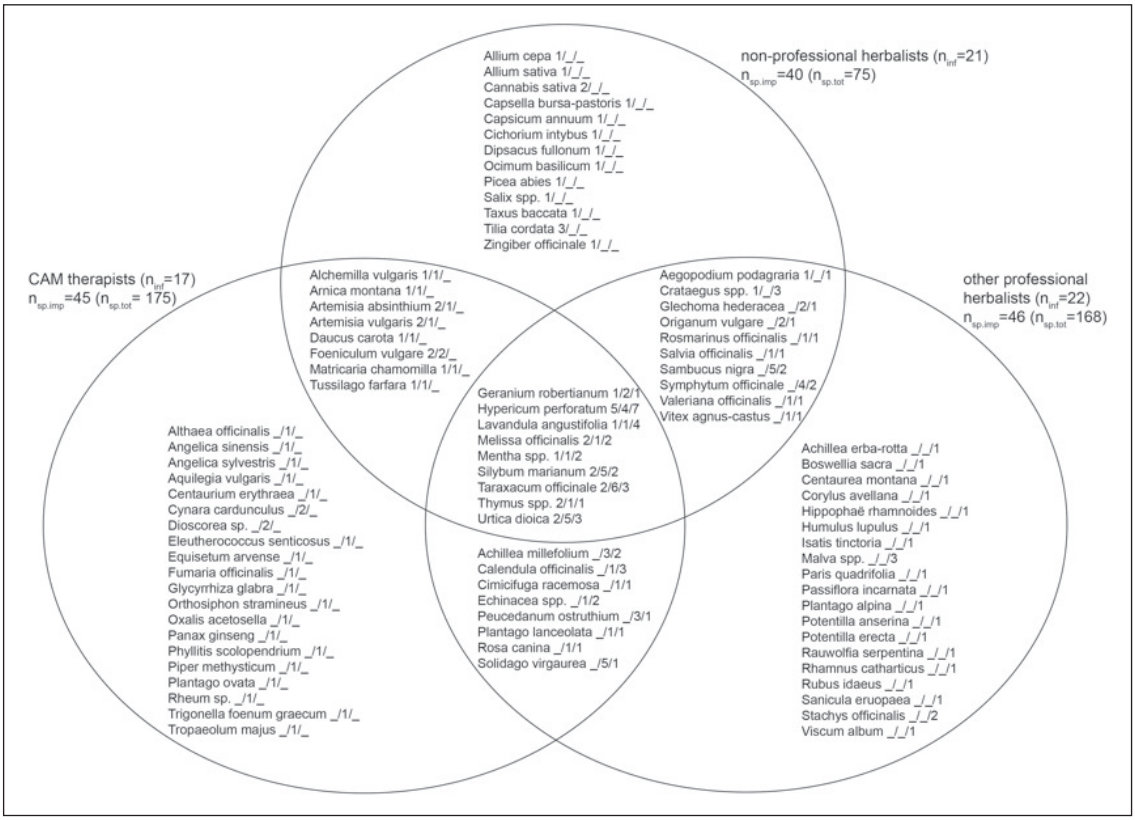

Fig. 8. Medicinal plant preferences of non-professional herbalists (laypeople), CAM therapists, and other professional herbalists; the numbers indicate use reports in the different subgroups. The figure is based on the 5 most important species ($n_{sp.imp}$) mentioned by the interviewees. The total number of species mentioned in the freelists ($n_{sp.tot}$) is also given.

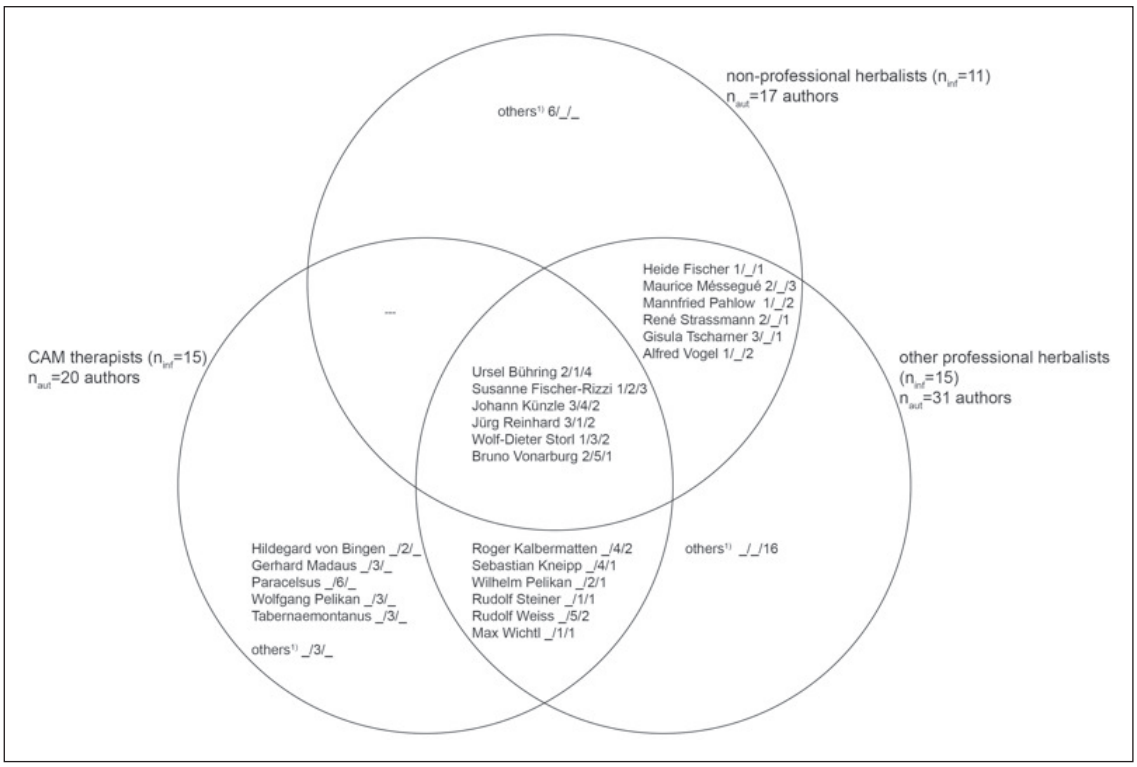

Fig. 9. Authors reported as important knowledge sources by n = 41 herbalists

perforatum is common. This species is known for its complex multicomponent composition which allows for diverse uses and production of remedies [27]. Intensive promotion of St. John's wort as phytotherapeutic agent and high media attention probably also reinforced its widespread use. Broadly used are also *Lavandula*, *Melissa,* and *Mentha*. These are well-known and well-researched plants with a wide spectrum of uses ranging from wellness and well-being to specific medicinal purposes as sedative and digestive drugs [28–31].

Overall, non-professional herbalists (people who use plants for self-medication) use a smaller number of medicinal plants than professionals. This is in line with findings from other ethnobotanical studies from Switzerland [32–34]. We also found differences between professionals and non-professionals in their understanding and definition of medicinal plants. While professionals tend to clearly separate medicinal plants from food plants, probably influenced by the official regulations on medicinal plant use, non-professionals have a slightly different understanding and broader spectrum of what they perceive as medicinal. They often use typical food plants for self-medication, e.g., administer potatoes or cabbage topically against joint pain or onions against cough; or they prepare wild vegetables in an especially healthy manner for food consumption. Consequently the boundaries between food and medicinal plants are blurred and a species is perceived as food or medicine, depending on the use-context. This phenomenon has been widely shown in various studies [35–38]. While non-professional herbalists are less concerned by regulations and also interested in non-legally available plants, such as *Cannabis sativa*, professional herbalists and CAM practitioners prefer well-established plants with clear legal directives.

All in all, the plants used by the surveyed herbalists are well-known for their medicinal use and are documented in herbal books. Almost half of them (45%) have been documented since antiquity [14]. Herbalists mainly refer to recent medicinal plant books and contemporary authors as important sources of knowledge, such as Künzle [e.g., 39, 40], Vonarburg [e.g., 41], the textbooks of Bühring [e.g., 42] and Weiss [e.g., 43] as well as to authors with a very personal approach to medicinal plants like Storl [e.g., 44, 45] or Fischer-Rizzi [e.g., 46]. Yet, CAM practitioners also refer to old books from the monastic period and Renaissance by authors like Hildegard von Bingen [47], Tabernaemontanus [48], or Paracelsus [49] which are all available as modern editions.

The botanical patterns of the documented species are in line with our findings for the medicinal flora of Switzerland as a whole [14]. In our dataset, Lamiaceae, Rosaceae, and Apiaceae as well as trees and forest plants are overrepresented. Interestingly, alpine plants are significantly underrepresented. This stands in contrast to the vibrant tradition of medicinal plant cultivation and collection in the Swiss Alps [50]. This discrepancy is due to the fact that most medicinal plants cultivated in the Alps are non-alpine plants such as *Thymus* spp., *Mentha* spp., or *Melissa officinalis* [51] (alpine plants are defined as species growing above timber line [17]). Compared with previous ethnobotanical studies from Switzerland we found a total overlap of 57.1% of the documented species [32–34, 52, 53]. Compared to studies from the German speaking part only, the overlap increases to 63.4%. We argue that albeit the species used are generally well-known medicinal plants, there are regional differences and local substitutes for specific plants. Furthermore, while we have a strong focus on the professional sector in our study, the above-mentioned ethnobotanical studies mainly focus on non-professionals, which leads to the differences in use found for the examined species.

Conclusions

Medicinal plants are used for self-medication and professional health care in Switzerland. Herbalists, i.e. medicinal plant specialists with broad empirical plant knowledge, can be found in different parts of the medical landscape from CAM to biomedicine. Of the ca. 250 species mentioned by herbalists, predominantly leaves and flowers are used for the treatment of dermatological, respiratory, nervous, and gastrointestinal problems. Furthermore, a large variety of plants are used as tonics for disease prevention and to strengthen the immune system. All species mentioned are well-known medicinal plants. Despite different underlying medicinal concepts and philosophies, herbalists largely agree on the most important medicinal plant species. Among others these include the so-called detoxifying plants. Nevertheless, there are differences between herbalists with a biomedical or CAM background and non-professional herbalists reflected in, e.g., specific plant preferences or the understanding of the continuum between food and medicinal plants.

Recent and historical herbal books form an important source of plant knowledge. The historical herbal books in use are all available as modern editions and often serve as source of inspiration. Broad empirical plant knowledge thus forms an important complement to evidence-based phytotherapy.

Acknowledgments

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Disclosure Statement

The authors declare that there is no conflict of interests concerning this paper.

Supplemental Material

To access the supplemental material please refer to *www.karger.com/doi/10.1159/000438809.*

Appendix I. Questionnaire

Appendix II. Use categories

Appendix III. Medicinal plants used by herbalists in Switzerland

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